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ABSTRACT

Prepared as part of the ongoing series of publications designed to assist local and state government policy makers with cable television planning and decision-making, this glossary updates the document originally published in 1972. It contains definitions of terms frequently encountered in matters concerning cable television. (DGC)

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A GLOSSARY OF CABLE TERMS

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PREFACE

This document was prepared by the Cable Television Information Center under grants from the Ford Foundation and the John and Mary R. Markle Foundation to The Urban Institute.

The primary function of the center's publications program is to provide policy makers in local and state governments with the information and analytical tools required to arrive at optimum policies and procedures for the development of cable television in the public interest.

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EXPLANATORY NOTE

Because cable television is a rapidly changing technology, the center has revised the original booklet, "A Glossary of Cable Terms" published in 1972 as part of the Publications Service. This material replaces that publication entirely. The reader may wish to substitute this revision for the older material within the heavy "Glossary" cover in the white binder.

A GLOSSARY OF CABLE TERMS

Adjacent Channel Any of two TV channels are considered adjacent when their video carriers, either off-air or on a cable system, are 6 MHz apart. FM signals on a cable system two channels apart are adjacent when their carriers are 400 to 600 KHz apart.

Alphanumeric Keyboard In computer terminology, an array of keys similar to a typewriter keyboard, which permits communications with a computer in both letters and numbers. The term is frequently used to distinguish such keyboards from smaller numeric keyboards with 12 or less keys, permitting communications only in numbers (as for example with a pushbutton telephone keyboard).

Amplifier A device used to boost the strength of an electronic signal. Amplifiers are spaced at intervals throughout a cable system to rebuild the strength of television signals which weaken as they pass through the cable network.

Antenna A device used to transmit or receive broadcast signals.

Anti-siphoning FCC rules designed to prevent cable systems from "siphoning off" programming for pay-cable (or subscription television) channels that otherwise would be seen on conventional broadcast TV.

Attenuation A weakening in the strength of the signal usually measured in terms of a ratio of the diminished output signal strength level to the input signal strength level.

Audio The voice components of a television signal; also, aural broadcasting such as AM and FM radio.

Bandwidth A measure of spectrum (frequency) use or capacity. For instance, a voice transmission by telephone requires a bandwidth of about 3000 cycles per second (3 KHz). A TV channel occupies a bandwidth of 6 million cycles per second (6 MHz). Cable system bandwidth occupies 5 to 300 MHz on the electromagnetic spectrum.

Broadband A general term used to describe wide bandwidth equipment or systems which can carry a large portion of electromagnetic spectrum. A modern broadband communications system can accommodate all broadcast and many other services, with its 300 MHz capacity.

Broadcaster's Service Area Geographical area encompassed by a station's signal. (See "Grade A Contour" and "Grade B Contour".)

Broadcasting Transmitting electromagnetic signals in a multidirectional pattern over the air.

Cable TV Previously called Community Antenna Television (CATV). A communications system which distributes broadcast programs and original programs and services by means of coaxial cable.

Cablecasting Originating programming over a cable system. Includes public access programming.

Carriage A cable system's procedure for transmitting the signals of television stations on its various channels. FCC rules determine which signals cable systems must or may carry.

Carrier The electronic wave signal which is transmitted over the air or by cable, at a specified frequency, and which carries information. For example, a television signal includes a video carrier, located 1.25 MHz from the lower edge of the 6 MHz channel space, and an audio carrier located 4.5 MHz above the video carrier.

Cartridge Container for recorded programming designed to be shown on a television receiver. The cartridge contains a reel of motion picture film, videotape or electronically embossed vinyl tape, blank or recorded, and uses an external take-up reel.

Cassette A self-contained package of reel-to-reel blank or recorded film, videotape or electronically embossed vinyl tape. Similar to a cartridge, but both reels are enclosed. When used to record television signals, the cassette is part of a video cassette system.

Certificate of Compliance (CAC) The approval of the FCC that must be obtained before a cable system can carry television broadcast signals.

Channel In television, a single path or section of the electromagnetic spectrum 6 MHz wide, which carries a television signal.

Channel Capacity The maximum number of 6 MHz channels which can be simultaneously carried on a cable TV system.

Closed Circuit A system of transmitting TV signals to private subscribers, in which the receiving and originating equipment are directly linked by cable, microwave or telephone lines, without broadcasting over the air.

Coaxial Cable Copper or copper-sheathed aluminum wire surrounded by an insulating layer of polyethylene foam, used by cable systems. The insulating layer is covered with tubular shielding composed of tiny strands of braided copper wire, or a seamless aluminum sheath. The wire and the shielding react with each other to set up an electromagnetic field between them.

Co-channel Interference The interference which results when a television receiver picks up two television stations broadcasting on the same channel number. The interference appears as horizontal bars on the television screen.

Common Carrier Any point-to-point communications relay service available to the general public at non-discriminatory rates. The carrier cannot control message content (e.g., telephone companies).

Community Antenna Relay Service (CARS) The 12.75 - 12.95 GHz microwave frequency band which the FCC has assigned to the CATV industry for use in transporting television signals to cable system headends.

Compulsory License A legal device whereby copyright holders would be legislatively required to license users of copyrighted material (cable operators) on a uniform basis and for a stipulated fee.

Contrast The range of light and dark values in a picture, or the ratio between the maximum and minimum brightness values. A high-contrast picture would contain intense blacks and whites; a lower-contrast picture would contain only shades of gray.

Converter A device used to convert television signals of one frequency to another frequency. Cable systems install converters where more than 12 channels are carried on a single cable, and to protect signals from the interference of strong local signals, by converting the cable channels to a channel where no local broadcast signals exist.

Cross Modulation A form of signal distortion in which modulation from one or more r-f carrier(s) is imposed on another carrier.

Crossownership Ownership of two or more kinds of communications outlets by the same individual or business. The FCC prohibits television stations and telephone companies from owning cable systems in their service areas. Television networks are prohibited from owning cable systems anywhere in the U.S.

Decibel (dB) One-tenth of a bel, a unit denoting the ratio of two amounts of power, being ten times the logarithm to the base 10 of this ratio.

Direct Pickup Reception of a broadcast signal sooner than the same signal arrives when carried by a cable system. Parts of a television receiver can act as an antenna, picking up the earlier and unwanted broadcast local signal, resulting in a ghost image on the television receiver screen. Direct pickup can be eliminated by proper shielding of the television receiver or by the use of converters.

Distant Signals TV signals which originate at a point too far away to be picked up by ordinary home reception equipment; also signals defined by the FCC as outside a broadcaster's license area. Cable systems are limited by FCC rules in the number of distant signals they can offer subscribers.

Distribution Plant The hardware of a cable system--amplifiers, trunk cable and feeder lines, attached to utility poles or fed through underground conduits like telephone and electric wires.

Downstream Signals traveling from the headend to subscribers' homes.

Dual Cable A method of doubling channel capacity by using two cables installed side by side to carry different signals.

Earth Stations Electronic facilities that use antennas and associated electronic equipment to transmit, receive and process communications via satellite. Some earth stations can only receive signals. Future cable systems may be able to interconnect by earth stations to domestic communications satellites, creating regional and national cable networks.

Echo A signal that has been reflected or otherwise returned with sufficient magnitude and delay to be perceived as a ghost image in a television picture.

Education Channel A channel that FCC rules require cable systems in the top 100 markets to set aside for educational uses, to be available without cost for the "developmental period." The developmental period of a cable system runs for five years from the time that subscriber service began, or five years after the completion of the basic trunk line.

Educational Television Station (ETV) A noncommercial television station primarily devoted to educational broadcasting.

Electromagnetic Spectrum A continuous range of frequencies of electromagnetic radiation (i.e. oscillating electrical and magnetic energy which can travel through space). Within the spectrum, waves have some specified common characteristics; the TV broadcast spectrum, for instance, ranges from 54 to 890 MHz. (See "Frequency".)

Exclusivity The provision in a commercial television film contract that grants exclusive playback rights for the film or episode to a broadcast station in the market it serves. Under the FCC's rules, cable operators cannot carry distant signals which would violate local television stations' exclusivity agreements.

Facsimile Transmission The electronic transmission of pictures, charts, graphs, etc., from one place to another by radio telegraphy or telephone. With special facsimile equipment, a home television receiver may be able to receive mail and newspapers by cable.

Feeder Line An intermediate cable distribution line connecting the main trunk line to the smaller house drops that lead into residences.

Fiber Optics Long and very thin glass fibers which have the property of transmitting light signals with remarkably little distortion and attenuation. Light signals can be modulated to carry information such as data or television signals. The potential channel capacity of fiber optic systems is very large--perhaps as many as 1,000 or more television channels in a single glass fiber. Structurally, the fiber consists of two types of glass (each with slightly different optical properties), with one type surrounding the other.

Filter A circuit which passes the signals of desired channels, and blocks others. Used in trunk and feeder lines for special cable services such as two-way operation.

Frame Grabber An electronic apparatus which may be connected to a home television receiver. It will record a single television signal image frame (that is, one of the images transmitted 30 times per second), store the signal image electronically, and play it over and over again on the television receiver, so that it is seen by the viewer as a still television image. When such devices are

connected to a two-way cable television system and controlled by a computer, individually addressed and different frames may be sent to hundreds of subscribers in rapid sequence over a single TV channel. Such systems permit large-scale applications of computer assisted instruction and individualized information retrieval via cable television.

Franchise Contractual agreement between a cable operator and the governing local authority authorizing the operator to build and operate a cable system in that community.

Frequency The number of times an electromagnetic signal repeats an identical cycle in a unit of time, usually one second. One Hertz (Hz) is one cycle per second. A Kilohertz (KHz) is one thousand cycles per second; a Megahertz (MHz) is one million cycles per second; a Gigahertz (GHz) is one billion cycles per second.

Full Network Station A commercial television broadcast station that generally carries 85 per cent of the hours of programming offered by one of the three major national networks during its weekly prime time hours.

Grade A Contour The line encompassing a television station service area in which a good picture is estimated to be available 90 per cent of the time at 70 per cent of the receiver locations. Signal contours determine what educational channels are carried on a cable system and, in smaller markets, what stations must be carried from other small markets.

Grade B Contour The line encompassing a television station service area in which a good picture is estimated to be available 90 per cent of the time at 50 per cent of the receiver locations. The Grade B Contour is larger than and surrounds the Grade A Contour.

Grandfathering Exempting cable systems from regulatory or legislative enactments because 1) they were in existence or operation before the rules, or 2) substantial investments were made in system construction before the rules. FCC grandfathering applies, for example, to signal carriage and certain crossownership situations.

Hardware The equipment involved in production, storage, distribution or reception of electronic signals. In cable it means the headend, the coaxial cable network, amplifiers, the television receiver and production equipment such as cameras and videotape recorders.

Headend Electronic control center--generally located at the antenna site of a cable system--usually including antennas, preamplifiers, frequency converters, demodulators, modulators and other related equipment which amplify, filter and convert incoming TV signals to cable system channels.

High VHF Band Part of the frequency band which the FCC allocates to VHF broadcasting, including channels 7 through 13, or 174 through 216 MHz.

House Drop The coaxial cable that connects each building or home to the nearest feeder line of the cable network.

Independent A TV station that has no exclusive affiliation which obliges it to carry programs from one of the national networks.

Instructional Television Fixed Service (ITFS) A fixed station operated by an educational organization and used primarily for the transmission of visual and aural instructional, cultural, and other types of educational material to one or more fixed receiving locations (usually schools).

Interactive See "Two-way Capacity."

Interchangeability The ability to exchange tapes between different manufacturers' videotape recorders with no appreciable degradation of playback image.

Interconnect To link cable headends, usually with microwave, so that subscribers to different cable systems can see the same programming simultaneously.

Interference Energy which tends to interfere with the reception of the desired signals, such as signals on the same or adjacent channels, or "ghosting" from reflecting objects such as mountains, buildings and airplanes.

Intermodulation Distortion Form of interference involving the generation of interfering beats between two or more TV signal carriers. The interfering beats have a precise mathematical relationship to the TV signal carriers which cause them.

Leapfrogging Cable operators' practice of skipping over one or more of the nearest TV stations to bring in a more distant signal on the cable. FCC rules establish priority for carrying stations that lie outside the cable system's service area.

Leaseback The practice by telephone companies, cable equipment manufacturers and others, of installing and maintaining cable distribution systems, and "leasing" the facilities "back" to separate contractors for operation of the system.

Leased Channels Channels made available by the cable system for lease. In addition to the designated channels (education, government and public access) and over-the-air broadcast signals, cable systems must make the remainder of their channels available for lease with at least one channel available to part-time users. Channels can be leased by groups or individuals for the sole use of the lessee at posted rates.

Local Distribution System (LDS) A broadband microwave system capable of transporting a number of television signals simultaneously. Used to interconnect cable system headends, using CARS microwave frequencies.

Local Government Channel A channel that FCC rules require cable systems in the top 100 markets to set aside for local government use, to be available without cost for the "developmental period." That period runs for five years from the time that subscriber service began, or until five years after the completion of the basic trunk line.

Local Origination Channel A channel on a cable system which is programmed by the cable system and subject to its exclusive control.

Local Signals Television signals received at locations that are within the station's Grade B Contour. Cable systems must carry all local signals in their areas.

Low VHF Band The part of the frequency band allocated by the FCC for VHF broadcast television, including television channels 2 through 6, or 54 through 88 MHz.

Microwave Line-of-sight, point-to-point broadcast transmission of signals at high frequency. Many CATV systems receive some television signals from a distant antenna location with the antenna and the system connected by microwave relay.

Mid Band The part of the frequency band that lies between television channels 6 and 7, reserved by the FCC for air, maritime and land mobile units, FM radio and aeronautical and maritime navigation. Mid band frequencies, 108 to 174 MHz, can also be used to provide additional channels on cable television systems which provide subscribers with converters.

Modulator The electronic equipment required to process video and audio signals and convert them to radio frequencies (r-f) for distribution on a cable system.

Multiple System Operator (MSO) A company which owns more than one cable system.

Multipoint Distribution Service (MDS) Stations are intended to provide one-way microwave radio transmission (usually in an omnidirectional pattern) of customer supplied programming from a stationary transmitter to multiple receiving facilities located at fixed points designated by the customer. MDS operators must operate as common carriers.

N + 1 A formula referring to FCC requirements that provide for expansion of channel capacity for nonbroadcast use. If the governmental, educational, public access and leased channels are in use 80 per cent of the weekdays (Monday through Friday) for 80 per cent of the time during any three-hour period for six consecutive weeks, the system operator must expand the system's channel capacity within six months.

Net Weekly Circulation (NWC) The estimated number of television households viewing a particular station at least once per week, Monday - Sunday, 6 am to 2 am, EST. Used to determine whether a station is "significantly viewed" in an area and must be carried by a cable system operating in that area.

Network Group of radio or television outlets linked by cable, satellite or microwave that transmit identical programs simultaneously, or the company that produces programs for them. More generally, any interconnected group of communications facilities.

NTSC The National Television Systems Committee (NTSC) was created by the FCC in 1951 to determine the optimum system and standards for color television so that color rendition would be satisfactory and the ultimate system would be compatible with black and white standards. A report encompassing the recommendations of its various panels was submitted to the commission in 1953 and became the basis for present standards for broadcast television.

Off-the-air Reception of a TV signal that has been broadcast through the air.

Office of Telecommunications Policy (OTP) Division of the Executive Office of the President staff that advises the Executive Branch on communications policy, studies policy questions and develops legislative proposals.

Ordinance A local law which governs the institution and operation of a cable television system in a community.

Overlapping Markets A case where a TV station's Grade B Contour is overlapped by the Grade B Contour of a television station located in a different market.

Pay TV A system of television in which viewers pay directly for programs not available on advertiser supported television. Scrambled signals are usually distributed and unscrambled at the homeowner's set with a decoder. Subscribers pay for programs either per channel, in which monthly payment covers all programming on a continuously operating

channel; or per program, in which the decoder is activated upon payment for a specific program. Current examples of pay fare include sports programs, first-run movies, cultural events or professional training. Pay TV on cable systems is also known as pay cable, subscription television and premium television.

Penetration In reference to a cable system, the ratio of the number of subscribers to the total number of households passed by the system. Penetration is the basis of a system's profitability.

Performance Standards The minimum technical criteria that must be met by cable systems, consistent with standards set by the FCC or the local ordinance.

Pole Attachment When cable systems use existing pole lines maintained by power and telephone companies, an attachment contract must be negotiated between the parties of interest.

Program Nonduplication Under FCC rules, a cable system must black out the programming of a distant television station it carries, when the system would duplicate a local station's programming, on the request of the local station.

Public Access Channel A channel that FCC rules require cable systems in the top 100 markets to set aside, along with the education and local government channels, in order to insure that divergent community opinion is aired on cable television. Five minutes of time on the public access channel is free and available at all times on a first-come, first-served basis for noncommercial use by the general public.

Push-Pull Amplifier An electronic amplifier in which there are two identical signal paths connected in such a way that the electronic processing of the signal is balanced and distortion is reduced. Push-pull amplifiers improve cable television system performance.

Receiver Isolation The attenuation between any two receivers connected to the system.

Signal Level The root mean square voltage measured during the r-f signal peak. It is usually expressed in microvolts referred to an impedance of 75 ohms, or in dBmV, the value in decibels with respect to a reference level of 0 dBmV, which is 1 millivolt across 75 ohms.

Signal to Echo Ratio The ratio of desired signal strength to the level of echoes which are time displaced (that is, they appear on the television receiver to be to the right or left of the desired signal by a perceptible amount). Echoes appear in television pictures as ghosts. The signal to echo ratio is a measure of cable system electronic performance.

Signal to Hum Modulation Ratio The ratio of desired signal strength to undesired hum modulation level in the signal. Hum modulation is a form of signal distortion introduced by the electronics in a television transmitter or a cable system, and is perceived in a television picture as one or more sets of horizontal light and dark bars. It is sometimes a result of malfunction in the television receiver. Signal to hum modulation is a measure of signal transmission performance in television broadcasting and cable television distribution.

Signal to Noise Ratio The ratio of desired signal strength (especially television signals) to undesired noise level present in the signal, expressed in dB. A signal to noise ratio is thus an expression of how much objectionable noise is present in a television picture.

Software Programming and programming materials such as films, videotapes and slides; or, computing routines in a computer.

Special Effects Generator A device permitting combinations of images on a television screen supplied by one or more video inputs.

Splitter A passive device (one with no active electronic components) which distributes a television signal carried on a cable in two or more paths.

Sports Blackout Federal law requiring cable systems and television stations to delete coverage of local sports events to protect gate receipts.

Sub Band The frequency band from 5 MHz to 54 MHz, which may be used for two-way data transmission or upstream video signals on a two-way cable system.

Subcarrier A carrier which is in turn carried by another carrier. The color information in a television signal, for example, is modulated onto a subcarrier at 3.58 MHz higher in frequency than the video carrier.

Subscriber A person who pays a fee for cable services.

Super Band The frequency band from 216 to 300 MHz, used for fixed and mobile radios and additional television channels on a cable system.

Switched Access A communications service in which each subscriber may communicate with any other subscriber.

Switcher A control which permits the selection of one image from any of several cameras to be fed into the television display or recording system.

Switcher/Fader A device permitting gradual, overlapping transition from the image of one camera to another. Sometimes incorporated as part of a special effects generator.

Sync. Generator A device used to supply a common or master synchronizing signal to a group of cameras or studios. This ensures that switches, fades or superimpositions between picture sources can be accomplished without tearing or rolling.

Synchronization Maintenance of simultaneous audio and video signals so that sound and picture operate in phase. Abbreviated "sync."

System Noise Refers to the random energy generated by thermal and other electronic effects in the system. It is specified in terms of the ratio of desired signal strength to noise strength, measured in decibels (dB). Excessive noise appears on a television picture as snow.

Tap A device installed in the feeder cable which connects the home TV set to the cable network. Also called a drop.

Tariff A schedule of services and rates filed by common carriers with regulatory bodies.

TASO The Technical Allocations Study Organization was a series of panels set up by the FCC in 1956 to provide information, some of which was used as a basis for technical standards. TASO panel #2 devised a relationship between objective technical performance measures and the degree of picture impairment reported by a panel of viewers.

Television Households A television household is a household having one or more television sets. Estimates for each county are based on an updating of American Research Bureau (ARB) TV penetration estimates. The number of households that watch television in any locality during prime-time hours determines the top 100 markets for FCC cable rules.

Television Market A city or complex of neighboring cities served by commercial television broadcast signals from one or more TV stations located within the area. The FCC uses television markets for designating what kind of cable services an operator should provide in terms of signal carriage and nonbroadcast channel use.

TV Penetration The percentage of homes having one or more television sets at the time of the American Research Bureau survey. The ARB surveys local markets from October through July; the number of surveys in a year depends on the size of the market.

Terminal The equipment added to a cable subscriber's set, including connectors, transformers and converter (if necessary), plus more

sophisticated components such as digital response keyboards, video-tape recorders, single frame video refresh, etc.

Top 100 Market Ranking of largest television broadcast areas by size of market, i.e. number of viewers and TV households. Used in FCC rulemakings and in selling of air time to advertisers.

Translators A type of broadcast relay system which picks up signals from distant or blacked-out television stations, converts the signals to another channel to avoid interference and retransmits them into areas the original signals could not have reached. Translators do not use cable to reach subscribers' homes and do not offer the other kinds of services that cable can provide (local origination, two-way operation, etc.).

Triple Beat Noise A form of intermodulation distortion which results from the interaction of a large number of signal carriers on cable systems with 30 or more channels. The interference shows up in the television picture as beats or streaks. On a 30-channel system, channel 7--one of the worst cases--will present more than 100 interfering beats, appearing somewhat like background noise.

Trunk Line The major distribution cable used in cable TV. It divides into feeder lines which are tapped for service to subscribers.

Two-Way Capacity Ability of a cable system to conduct signals to the headend as well as away from it. Two-way or bi-directional systems carry data and audio and video television signals in either direction.

Upstream Signals traveling from subscribers to the headend.

UHF Ultra High Frequencies, the range of frequencies extending from 300 to 3,000 MHz; also, television channels 14 through 83.

VHF Very High Frequencies, the range of frequencies extending from 30 to 300 MHz; includes television channels 2 through 13.

Video The visual components of a television signal.

Video Cassette System A system of recording and playback of video images onto an enclosed reel of videotape. Video cassettes, cassette players and cassette recorders are commonly described in terms of the width of the magnetic tape, e.g. 1/2-inch, 3/4-inch, etc. They record both black and white and color images, permitting both recording and playback (via video cassette recorders), or only playback (via video cassette players), using a typical home television receiver.

Video Disc System A system of recording video images on a disc similar to a phonograph record. Recording and playback involves in some systems magnetic heads similar to those used in tape recording, and in others a laser beam. Video disc players are designed to permit home viewing of programs selected by buying or renting video discs, and may be marketed in the last half of the decade.

Videotape Used for magnetic recording of video and audio signals, with instant playback. Videotape comes in half-inch, three-quarters, one and two-inch widths and can be erased and re-recorded.

Video Signal The original video signal (which occupies a frequency from 30 cycles to 4.2 MHz) before it is modulated and converted to radio-frequency for broadcast or cablecast. A home television set reconverts radio-frequencies to a video signal.

VTR Abbreviation for videotape recorder, a device which allows the recording and playback of magnetic tape sound and picture recordings.

"Wired City" The concept of television and other communications, data, educational material, instructional television and information retrieval service that wired services can provide. Broadcast services must, of necessity, be limited by scarce spectrum space; wired services have theoretically unlimited channel capacity. (Originally discussed in the article "A Proposal for Wired City Television" by Harold J. Barnett and Edward Greenberg in the Fall 1967 issue of the Washington University Law Quarterly.)